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May 40

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HEADQUARTERS UNITED STATES AIR FORCE

R6 341

ROUTING AND RECORD SHEET

TOP SECRET
AUTH CS, USAF

2-19988

TALLY NO. | CONT. #
FILE NO. | HQ USAF

SUBJECT: Research and Development on Proposed Rand Satellite (SECRET) Reconnaissance Vehicle

TO: Director of Intelligence, DCS/O
Asst. for Dev. Planning (AFDDC/AE)

DATE 21 June 1951

COMMENT NO. 2

FROM: Deputy Chief of Staff, Development.

Col Schriever/js/77340

(This document consists of 2 pages.
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1. The Daily Staff Digest Item referred to in paragraph 4, Comment #1, erroneously conveyed the impression that a future urgent need for reconnaissance was a pre-requisite for justifying the Satellite Reconnaissance system. This office is well aware of the urgency of having a current capability for aerial reconnaissance of the USSR. Time wise, however, the Satellite cannot fulfill this requirement. Under maximum development effort a Satellite Reconnaissance System is estimated to be from seven to ten years in the future.

2. The Satellite Vehicle is considered to be technically feasible, but there are many extremely difficult research and development problems which must first be solved. Some of the most difficult are:

a. Shortage of Competent Personnel: The guided missile program is now suffering from such a shortage. Personnel of the competence required, and in the quantity needed are not available for the Satellite Program.

b. Reliability: Continuous unattended operation over a year's period is required of both electronic and mechanical components. This has not been accomplished and presents a problem of great magnitude.

c. Attitude Control: Once the Satellite is established in its orbit it is necessary to maintain proper vehicle attitude. For television scanning the mid-point of the television camera must always point towards the center of the earth. RAND studies have indicated several complex means for obtaining the proper vehicle orientation. However, the equipments for such control systems do not now exist.

d. Propulsion: It is possible that the MX 770 alcohol-oxygen 75,000 lb thrust rocket may be adequate for the boost and main propulsion. However, the low fuel-to-weight ratios will lead to cumbersome structures. Large rockets with higher impulse fuels are not available.

e. Television Transmission: Transmitting television signals over exceedingly long distances presents many problems in the fields of propagation and antenna design. It is believed that reliable television operation can be accomplished over great distances eventually, but considerable basic research remains to be done.

3. In addition to the technical problems emmerated above the Satellite Program will be extremely expensive. Estimates of cost vary from 500 million to one billion dollars.

4. Work on the Satellite will be continued in the amount of $400,000 to cover work on the auxiliary power plant, the television system and the attitude control

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CONTINUED:

system. In addition, other research and development projects will contribute indirectly. Among these are:

a. The North American MX770 Alcohol-Oxygen 75,000 lb thrust rocket.

b. The CONVAIR 5,000 mile Mach 6 ballistic rocket study.

c. Several television projects including:

(1) Television for flight testing of aircraft.

(2) Television reconnaissance system.

5. Other unconventional means for obtaining pre-war aerial reconnaissance have been investigated. Two systems show promise and each is being supported in the research and development program. They are:

a. The SNARK Missile.

b. The GOPHER Project.

The latter is the more promising from the standpoint of timeliness, technical feasibility and capability of avoiding enemy detection and interception. It is planned that an operational system will stem from the GOPHER Project by late 1952. The SNARK missile presents greater technical problems and has the disadvantage of being more vulnerable to detection and possible enemy interception.

6. The conclusions regarding a Satellite Reconnaissance Vehicle, based on a consideration of technical promise, time required for development and other urgent development needs are that the Satellite Program is receiving as much emphasis as is warranted in relation to the research and development program as a whole.

Incl n/c

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